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Chapter 9 – Safety and Climbing

Maryland DNR Forest Service – Urban & Community Forestry
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SAFETY and CLIMBING

The *ANSI Z133.1 Standards* contain arboriculture safety requirements for pruning, repairing, maintaining, and removing trees; cutting brush; and for using equipment in such operations.

SAFETY and CLIMBING

- The *ANSI Z133.1 Standards* All Licensed Tree Experts shall comply with safety standards while working in the State of Maryland.

SAFETY and CLIMBING

Each person, employee or other, shall:

be responsible for his/her own safety;

comply with the appropriate Federal and state occupational safety and health standards and all rules, regulations, and orders which are applicable to his/her own actions and conduct.

SAFETY and CLIMBING

Employers shall:

instruct their employees in the proper use, inspection and maintenance of tools and equipment, including ropes and lines; and

require that appropriate working practices be followed.

SAFETY and CLIMBING

A job briefing shall be performed by the qualified tree expert in charge before the start of each job. The briefing shall be communicated to all affected workers.

SAFETY and CLIMBING

Personal Protective Equipment

Clothing and footwear appropriate to the known job hazards shall be approved by the employer and worn by the employees.

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Personal Protective Equipment

Workers shall wear head protection that conforms to ANSI Z89.1.

Class E helmets shall be worn when working in proximity to electrical conductors, in accordance with ANSI Z89.1.

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Personal Protective Equipment

Face and eye protection shall comply with ANSI Z87.1.

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Personal Protective Equipment

When noise levels exceed acceptable standards, as established by Federal regulations, approved hearing protection shall be provided by the employer and worn.

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Personal Protective Equipment

Chain saw-resistant leg protection shall be worn while operating a chain saw during ground operations.

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General Safety

A first-aid kit, adequately stocked & maintained, shall be provided by the employer.

Tree Experts and other workers shall be instructed in its use and specific location.

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General Safety

Instruction shall be provided in the identification, preventive measures and first-aid treatment of common poisonous plants (poison ivy, poison oak and **poison sumac**), stinging/biting insects and other pests indigenous to the area in which work is to be performed.

Photo: Ted Bodner, Southern Weed Science Society, www.forestryimages.org

SAFETY and CLIMBING

Traffic Control

Effective means for controlling pedestrian and vehicular traffic shall be instituted on every job site where necessary in accordance with U.S. DOT *Manual on Uniform Traffic Control Devices* (MUTCD), or applicable state and local laws and regulations.

SAFETY and CLIMBING

Electrical Hazards

All overhead and underground electrical conductors and all communication wires and cables shall be considered to be energized with potentially fatal voltages.

Electrical shock may occur during a ground fault simply by standing near the grounding object.

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Electrical Hazards

Only qualified line-clearance tree experts or qualified line-clearance tree expert trainees shall be assigned to work where an electrical hazard exists.

Qualified line-clearance tree expert trainees shall be under the direct supervision of qualified line-clearance tree expert.

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Electrical Hazards

An electrical hazard exists when a worker, tool, tree, or any other conductive object is closer than ten feet from an energized electrical conductor rated 50 kV, phase-to-phase, or less.

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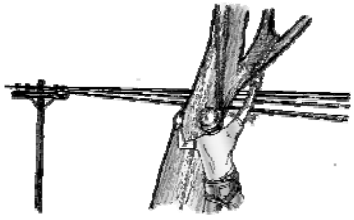
Electrical Hazards

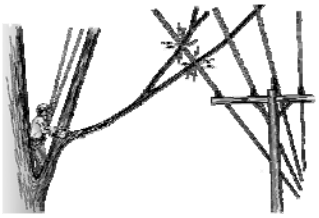
Direct contact is made when any part of the body contacts an energized line.



SAFETY and CLIMBING

Electrical Hazards

Indirect contact occurs when any part of the body touches a conductive object that is in contact with an energized line.



Conductive objects include a saw, tree branch or another person. Even in an insulated bucket truck indirect contact can be made.

SAFETY and CLIMBING

Electrical Hazards

When climbing a tree, the tie-in position should be above the work area and located in such a way that a slip would swing the tree expert away from any energized electrical conductor or other identified hazard.

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Electrical Hazards

Footwear, including lineman's overshoes, having electrical-resistant soles, shall not be considered as providing any measure of safety from electrical hazards.

SAFETY and CLIMBING

Electrical Hazards

Rubber gloves, with or without leather or other protective covering, shall not be considered as providing any measure of safety from electrical hazards.

SAFETY and CLIMBING

Electrical Hazards

Qualified line-clearance tree experts and qualified line-clearance tree expert trainees performing line clearance in the aftermath of a storm or under similar conditions shall be trained in the special hazards associated with this type of work.

SAFETY and CLIMBING

Aerial Devices

Aerial devices shall be provided with a point of attachment to secure a full body harness with a shock-absorbing lanyard or body-belt and lanyard.

Fall protection shall be worn when working aloft.

SAFETY and CLIMBING

Aerial Devices

Aerial devices shall not be used as cranes or hoists to lift or lower materials, unless specifically designed by the manufacturer to perform such operations.

SAFETY and CLIMBING

Aerial Devices

Wheel chocks shall be set before using an aerial device, unless the device has no wheels on the ground or is designed for use without chocks.

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Aerial Devices

No part of the boom or bucket shall make contact with energized electrical conductors, poles, trees or similar objects.

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Brush Chippers

Brush chippers equipped with a mechanical infeed system shall have a quick stop and reversing device on the in-feed system, which shall be:

- close to the feed end of the in-feed hopper;
- located across the top & along each side of the in-feed hopper;
- within easy reach of the worker.

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Brush Chippers

Trailer chippers, when detached from the vehicles, shall be chocked or otherwise secured in place.

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Brush Chippers

Vision, hearing and/or other appropriate personal protective equipment shall be worn when in the immediate area of a brush chipper in accordance with ANSI Z133.1 standards.

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Stump Cutters

Towable stump cutters or stump cutter trailers, when detached from the vehicle, shall be chocked or otherwise secured in place.

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Chain Saw Safety

ANSI Z133.1-2000 standards require that when a chain saw is being started, it shall be held firmly in place on the ground with the chain brake engaged.

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Chain Saw Safety

The kickback zone of a chainsaw is the front upper quadrant.

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Chain Saw Safety

Kickback happens while, in making a cut, the top of the bar nose contacts a solid object or is pinched. This causes the guide bar to fly back towards you.

Kickback occurs at a rate twice as fast as a human can react.

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Chain Saw Safety

Direction of Safe Retreat

• 45 degrees from the sides and back on either side .

• NEVER move away directly behind the tree-you can be seriously hurt if the tree butt kicks back during the fall.

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Chain Saw Safety

How to Retreat

•Using a bore cut and a release cut will make it easier to retreat in plenty of time

•Don't turn back on the falling tree

•Walk quickly away to a distance of 20 feet from the falling tree

•Position yourself behind a standing tree if possible.

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Chain Saw Safety

A **conventional notch** is a directional felling cut into the side of a tree, facing the intended direction of fall and consisting of a horizontal face cut and an angle cut above it, creating a notch of approximately 45 degrees.

Notches shall be used for felling all trees over 5 inches dbh.

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Chain Saw Safety

A **Humboldt notch** is a directional felling cut facing the direction of fall and consisting of a horizontal face cut and an angled cut below it.

A Humboldt cut is usually reserved for larger trees on steep slopes.

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Chain Saw Safety

An **open-faced notch** is a directional felling cut facing the intended direction of fall and consisting of two cuts creating a notch greater than 70 degrees.

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Chain Saw Safety

Be sure that the back cut does not penetrate into the predetermined hinge area.

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Limbing and Bucking

When limbing & bucking, the tree expert must stand on the uphill side of the work.

SAFETY and CLIMBING

Limbing and Bucking

Whenever possible, cut limbs on the opposite side of the tree trunk from which you are working. Doing so keeps the tree trunk between you and the saw.

SAFETY and CLIMBING

Limbing and Bucking

Wedges should be used as necessary to prevent binding of the guide bar or chain when bucking up trunks of trees.

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Climbing Safety

Before climbing:

- Inspect the tree and site for potential hazards.
- Understand the objective for the climbing job.
- Wear PPE (Personal Protective Equipment) and clothing suitable for work condition and weather.
- Do not wear jewelry.
- Follow safety standards.
- Take precautions and use caution.

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Climbing Safety

When a tree expert or arborist is working in a tree other than from an aerial device, chain saws weighing more than 15 pounds service weight shall be supported by a separate line or tool lanyard.

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Climbing Safety

Carabiners used to secure the tree expert climbing line shall:

- be of the self-closing type;
- be positive-locking;
- have a minimum tensile strength of 5,000 pounds.

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Climbing Safety

Tree Experts and Arborists shall have a minimum of two means of being secured while working aloft.

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Climbing Safety

A figure-eight knot shall be tied in the end of the arborist's climbing line to prevent pulling the rope through the climbing hitch, when working at heights greater than one-half the length of the arborist's climbing line.

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Climbing Safety

A **hitch** is a knot used to secure a rope to an object, another rope, or the standing part of the same rope

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Climbing Safety

A **climbing hitch** is used for securing a climber to the climbing line, permitting controlled ascent, descent & working position.

Ex: tautline; Blake' & Prusik hitches.

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Climbing Safety

The **secured footlock** is a method used to climb a suspended rope.

A **Prusik** loop, fashioned with an acceptable friction hitch, shall be used by the climber when footlocking.

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Climbing Safety

Friction hitches are used for safety in ascent, work positioning and descending.

Ex: Blake's hitch; Kleimheist knot, Prusik knot; and tautline hitch.

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Climbing Safety

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The **Blake's Hitch** is an example of a friction hitch. It should only be used on arborist rope.

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The **Kleimheist Knot** is an example of a friction hitch.

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The **Prusik Knot** is an example of a friction hitch.

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The **Tautline Knot** is an example of a friction hitch.

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The **clove hitch**, Girth hitch, sheet bend and timber hitch are examples of attachment knots.

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Climbing Safety

Limbs and branches can be lowered by using the **clove hitch**.

Tree Experts and Arborists should be above or to the side of the limb being lowered when large limbs are lowered in sections.

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Climbing Safety

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The **Girth hitch**, sheet bend and timber hitch are examples of attachment knots.

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The clove hitch. Girth hitch, sheet bend and **timber hitch** are examples of attachment knots.

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Climbing Safety

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The clove hitch. Girth hitch, **sheet bend** and timber hitch are examples of attachment knots.

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Climbing Safety

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Bowline hitch is used as an end-line knot.

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The **anchor hitch** is used as an end-line knot.

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The **buntline hitch** is used as an end-line knot.

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